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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,451	01/08/2001	Christopher M. Edwards	60311A	5541
109	7590	02/25/2004	EXAMINER	
THE DOW CHEMICAL COMPANY INTELLECTUAL PROPERTY SECTION P. O. BOX 1967 MIDLAND, MI 48641-1967			FONTAINE, MONICA A	
			ART UNIT	PAPER NUMBER
			1732	
DATE MAILED: 02/25/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/756,451	EDWARDS ET AL.	
	Examiner	Art Unit	
	Monica A Fontaine	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The dependency of Claim 3 is unclear. As currently amended, the first line reads "The process of claim 2 1...". For purposes of examination, Claim 3 will depend upon Claim 2.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Beck (U.S. Patent 6,365,081). Regarding Claim 1, Beck shows that it is known to carry out a pultrusion process for preparing a continuous fiber-reinforced thermoplastic composite article by continuously pulling the fibers through a process (Abstract) comprising the steps of drawing a fiber bundle continuously through a melt obtained by heating a thermoplastic resin (Column 5, lines 13-15, 21-23; Column 6, lines 2-5), impregnating the drawn fiber bundle with the melted thermoplastic resin to form a composite melt (Column 6, lines 2-10), drawing the composite melt through a consolidation die to form a thermoformable composite profile (Column 5, lines 66-67;

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Column 6, lines 1-10), thermoforming the composite profile on-line by which it is curved, twisted or provided with varied cross-sectional shape along its length (Column 7, lines 2-5), and cooling the shaped composite article to solidify the thermoplastic resin and provide an article that is curved, twisted or provided with a varied cross-sectional shape along its length (Column 4, lines 5-9).

Regarding Claim 10, Beck shows the process as claimed as discussed in the rejection of Claim 1 above, including a method wherein said reinforcing fibers are glass (Column 6, lines 41-48).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 5, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck, in view of Willenberg (U.S. Patent 4,828,775).

Regarding Claim 2, Beck shows the process as claimed as discussed in the rejection of Claim 1 above, but he does not give specific temperature ranges for his process. Willenberg shows that it is known to carry out a pultrusion process (Abstract) wherein thermoplastic resin includes a depolymerizable and repolymerizable thermoplastic resin having a Tg of not less than 50°C (Column 1, lines 47-52). Willenberg and Beck are combinable because they are concerned with a similar technical field, namely, that of pultrusion processes which form reinforced plastic

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articles. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use materials according to Willenberg's specifications during Beck's process in order to obtain a reinforced article useable in exclusive temperature conditions.

Regarding Claim 3, Beck shows the process as claimed as discussed in the rejection of Claims 1 and 2 above, but he does not specify a kind of thermoforming apparatus. Willenberg shows that it is known to carry out a pultrusion process wherein the thermoforming is performed by passing said composite profile shaped article through a rotary/catepillar-type die, at a temperature sufficiently high that the thermoplastic resin is at least softened enough that the composite profile can be shaped under the pressure imposed by the rotary die, and then cooling the shaped composite article to a temperature below the solidification temperature of the thermoplastic resin (Column 4, lines 1-21). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Willenberg's rotary/catepillar thermoforming die in Beck's process in order to make use of specific technology that easily forms certain shapes.

Regarding Claim 5, Beck shows the process as claimed as discussed in the rejection of Claim 1 above, but he does not show using a rotating die. Willenberg shows that it is known to carry out a pultrusion process wherein said thermoforming is performed by passing said composite profile through a rotating die while maintaining the composite profile at an elevated temperature such that it remains thermoformable, and then cooling the shaped composite article to a temperature below the solidification temperature of the thermoplastic resin (Column 4, lines 1-21). It would have been prima facie obvious to one of ordinary skill in the art at the time the

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invention was made to use Willenberg's rotary thermoforming die in Beck's process in order to make use of specific technology that easily forms certain shapes.

Regarding Claim 9, Beck shows the process as claimed as discussed in the rejection of Claims 1 and 2, including a method wherein said depolymerizable and repolymerizable thermoplastic is a thermoplastic polyurethane (Column 5, lines 50-51), meeting applicant's claim.

Regarding Claim 11, Beck shows the process as claimed as discussed in the rejection of Claims 1 and 2 above, including a method wherein said thermoplastic resin is a blend of a depolymerizable and repolymerizable polyurethane with polyvinyl chloride (Column 5, lines 39-55), meeting applicant's claim.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck, in view of Gross (U.S. Patent 4,897,230). Beck shows the process as claimed as discussed in the rejection of Claim 1 above, but he does not show varying the rate at which the composite moves through a die. Gross shows that it is known to carry out a thermoforming operation wherein one side of a shaped profile is hauled off at a faster rate than another side while maintaining the shaped profile at an elevated temperature such that it remains thermoformable, and then cooling the shaped article to a temperature below the solidification temperature of the thermoplastic resin (Column 5, lines 4-67; Column 7, lines 21-38). Gross and Beck are combinable because they are concerned with a similar technical field, namely, that of thermoforming processes. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to

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use Gross' thermoforming strategy during Beck's process in order to make a varying cross-section without needing specific machinery.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck and Gross, as applied to Claims 1 and 6 above, in further view of Medley et al. (U.S. Patent 4,076,570). Beck shows the process as claimed as discussed in the rejection of Claims 1 and 6 above, but he does not show a specific curved cooling die. Medley et al., hereafter "Medley," show that it is known to carry out a thermoforming process wherein the composite profile is passed through a curved cooling die that is equipped with internal means which forces some of the reinforcing fibers to travel a longer path through the die than others, and wherein the thermoplastic is solidified in said cooling die, thereby forming a curved composite article (Column 10, lines 25-31). Medley and Beck are combinable because they are concerned with a similar technical field, namely, that of pultruding and thermoforming composite articles. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Medley's cooling die in Beck's and Gross' method in order to avoid the need for cooling fluid and equipment associated therewith.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck, in view of Bramhall (U.S. Patent 4,323,533). Beck shows the process as claimed as discussed in the rejection of Claim 1 above, but he does not specifically show using a mandrel. Bramhall shows that it is known to carry out a thermoforming process wherein the thermoforming is performed by winding a composite profile on a mandrel as the means for pulling the composite through the

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die, and then cooling said shaped composite article to a temperature below the solidification temperature of the thermoplastic resin (Figure 7, elements 47 and 54). Bramhall and Beck are combinable because they are concerned with a similar technical field, namely, that of thermoforming composite articles. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Bramhall's mandrel in Beck's molding process in order to thermoform the composite article on the way to the cooling section without needing separate bulky dies.

### ***Response to Arguments***

Applicant's arguments, see the paper filed 8 January 2004, with respect to the rejection(s) of claim(s) 1-3, 5-11 under Moyer and Jacobson have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Beck, Willenberg, Gross, and Medley.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with regard to pultrusion and thermoforming in general:

U.S. Patent 3,507,728 to Bock et al.

U.S. Patent 4,256,797 to Stamper et al.

U.S. Patent 5,451,355 to Boissonnat et al.

U.S. Patent 5,591,463 to Padovani

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A Fontaine whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Maf  
February 13, 2004



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